



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2005GA82B

Title: Phosphorus Storage and Transport in Headwaters of the Etowah River Watershed

Project Type: Research

Focus Categories: Water Quality, Hydrology, Non Point Pollution

Keywords: phosphorus, soil, sediment, surface water, groundwater

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Non-Federal Matching Funds: \$36,000

Congressional District: 12th

Principal Investigator:

C. Rhett Jackson

University of Georgia

Abstract

In many watersheds of the southeastern U.S., manure management practices associated with intensification of livestock agriculture have resulted in large accumulations of phosphorus (P) in soils and other media. If P is transported to receiving surface waters, eutrophication may result. A variety of hydrologic and chemical controls govern the transport of P through surface and subsurface pathways within a watershed. Limited research has been performed on P storage and pathways at the watershed scale. We propose to investigate P storage and pathways in three headwater watersheds within the larger Etowah River in north Georgia. The Etowah River drains into Lake Allatoona, a mesotrophic to eutrophic reservoir that has been the focus of regulatory activities by the Georgia Environmental Protection Division and U.S. Environmental Protection Agency for reduction of phosphorus and chlorophyll a. Poultry production and other forms of livestock agriculture have been practiced in the Etowah River watershed since the middle 1900s. Two of our proposed study watersheds are used predominantly for poultry production. The third is a reference watershed in the Chattahoochee National Forest. We will develop detailed P budgets for each watershed and monitor P in different hydrologic pathways including overland flow, variable source area runoff, and groundwater. We will characterize the concentrations and forms of P in soils, sediments, atmospheric

deposition, animal manure, and the hydrologic pathways described previously. Our proposed study will augment a current study at the University of Georgia in which researchers are monitoring P and sediment yields from the proposed watersheds. Our objectives are to determine (1) how P yield is related to P in storage, (2) how P yield is related to present inputs of P, (3) how forms and concentrations of P vary in different hydrologic pathways, and (4) what the primary hydrologic and chemical controls are that affect P yield. Our proposed study has important implications for water quality management in the Etowah River watershed and other watersheds in the southeastern U.S.